Rec Febr 23
Febr 27

New York Feb. 19th. 1862.

Dr. Engelman Dear Sir - I enclose specimens of a few plants - collected in New-Jersey - whose locality is generally considered as not extending into that state. And write you at the instance of Dr Gray - to whom I have also sent specimens - but could get no satisfaction further than that "Dr. Engleman must determine such things"

Specimen No. 1 is Cuscuta Gronovii flor. majoribus Willd
" No. 2 " " Compacta Juss
" No. 3 " " Cerocensis ~~Juss~~ Beyrich
" No. 4 flor profundis Gronovii Willd (?)
" No. 5 flor. minutis ~~Chlorostata~~ Chlorocarpa Engelman (?)
" No. 6 Linum Virginianum L.
" No. 7 " Nov,
" No. 8 Spiranthes Nov. Sp. (?) Certainly new to the northern states. I sent Dr. Gray specimens of it at three several times, - each time accompanying the specimens with a detailed & minute description of the plant, - before he would recognize it as anything but the common S. Cernua! He gave in at last however but was unable to make it out definitely, and referred me to Dr. Engelman. I will give a brief description of the plant.

C. J. Austin
N York Febr 19 1862

Stem 15'-20' high, very slender, tapering upward - leafy at and near the base, leaves grass like - 3'-5' long - the blade early decaying - passing in to bracts - Spike slightly pubescent - tapering upward - flowers white with a yellowish tinge - much as in S. Cernua but not half as large - bracts broadly ovate abruptly pointed - about the length of pod - and with a broad white margin which when fresh is of the same texture as petals. intermediate between S. Cernua & S. Gracilis - probably if it exists in any northern herbarium it is confounded with both - yet it is very distinct from either. (Grows in Bergen Co. N.J.) also in Morris Co. and probably throughout the state) Flowers in July & Aug. in this latitude about two months earlier than S. Cernua,

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R. L. You need not
return the specimens
C. F. A.

Cuscutas Nos. 1-2 & 3 - I also sent to Dr. Gray - and in his answer he said that he could see no difference between ~~in~~ them and pronounced them all "C. Gronovii"! All from Bergen Co. N.J.

Nos. 4 & 5 are from Camden N.J. - I am quite positive No 5 is C. chlorocarpa at least it cannot be the same as either No 1 - 2 - or 3.

Concerning the Linums. I wish I could distinguish every species of plant, one from another as readily as I can tell these plants one from another. Both are plenty in Bergen Co. and present striking differences when growing. I have at least 1000 specim. of each and not a specimen exhibiting intermediate characters.

Will you be so kind as to answer me at the earliest opportunity. I enclose a stamp.

Direct Columbia College ~~N.Y.~~ New York. Care of Mr. Weeks.

Very truly yours. C. F. Austin

Recd March 19th
Ans 23d

Columbia College New York Mar. 1862

Dr. Engelmann — Dear Sir — I enclose a small portion of a Callitriche —— sp.? It grew on the tops of the highest hills on Staten Island and on the Palisades opposite this city (in New Jersey) in situations that have not been inundated since Noah's Flood —— Nor are they even inundated when it is raining)

I have not yet determined to which of our species it belongs. I have compared it with specimens in Drs. Torrey's and Gray's Herbarium — I find that it is not verna, nor autumnalis, nor peduncul~~ta~~osa of ~~nor~~ Nuttall, nor peploides of the same author; but I cannot say it is not the Marginata of Torr. & Gray in Bot. Whip. Expl. Exped. p. 135 nor can I say that it is that species. I will mention the only differences I have yet been able

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to detect between them. [Both have leaves, & stamens & pistils alike but in the C. Marginata the peduncle is very long and the fruit is more than twice as large as in this plant, and is also broadly winged. Whereas in our plant there is no wing yet I think I can occasionally detect abortive ovules. Dr. Torrey has this plant from Louisiana and also from Ohio but in neither case named. The fact is His specimens were dreadfully mixed up when I took hold of them. Dr. Gray has sent me his specimens to work up but I can find no literature on ~~the subject~~ ~~that~~ throws any light on this much neglected and befuddled genus.

[I have no doubt ~~my~~ our plant will prove to be the C Marginata as above]

Can you give me any assistance. or inform me in what works I will find foreign species described. I can find neither specimens nor description of but the three — Verna. autumnalis & pedunculata DC

I enclose specimens of Lemna minor & L. perpusilla — both in flower & fruit. I am under the impression ~~that~~ I had sent them before but if I have not no doubt you will be glad to see them, for one seldom sees a Lemna in flower in this Country.

Very truly Yours, C. F. Austin

Direct, Columbia College New York City
Care of Mr. Weeks

Rec^d Jan 25^th
Ans March 25

Closter N.J. Jan. 18th. 1863

Dear Dr. Engelmann — Your letter containing 4 specimens of Callitriche was received over a month ago at Albany. Many thanks for the specimens — which until now I have not had leisure to examine closely — The two European ones are C. autumnalis L. whether that is a good species or no I have not yet determined. All of its forms however — as far as I have observed — are easily separated from C. Verna. The difference is mainly in the fruit which in C. Verna is remarkably plump. & even in C. autumnalis on the other hand it is just the reverse & usually larger. The foliage also usually and probably always differs. The other 2 species, — one from near St. Louis — the other from Arkansas are both plainly C. Verna L. var. terrestris — which is only a state growing — when the water has left it — on the mud. Should have determined them all in 30 seconds but the Arkansas one had no fruit as I could see, but now upon picking away some dirt I find but one fruit which settles the matter beyond question.

The only good character for any of the 6 species that I have seen reside in the fruit. these are very characteristic & constant. so much so that with a mature fruit alone I can settle a species with a common lens, at a glance.

I have no specimens of C. peploides & neither marginata nor pedunculosa. and neither Drs. Gray or Torrey have any (to spare I think

I should like very much to have those specimens I returned to you.

By the way what have you in Hepaticae. These are my great hobby — I have also gone into the Sphagnums pretty thoroughly — anything in the line of these things would be most gratefully received. Or I would gladly name & return anything you might send me that you would like settled but could not spare. I have likewise studied up all the Leskeas I could get hold of. And if you ~~have anything~~ specimens ~~that~~ are not satisfactorily settled please send me a small fragment of each containing ripe fruit — stating the size & general contour of the plant with the arrangement of the branches — & size & shape of stem leaves.

I enclose specimens of ~~all~~ the Ricciae I have. If you have anything in this line please send it as I want to publish soon a little account of the North American species.
also 2 species of Notothylas. I can think of nothing else that would be apt to interest you that I have. If you can let me know — please — and I will try to send it

The pamphlet ~~was received~~ came shortly after receiving the letter — and afforded me much interest. I am very grateful for the favor.

Very truly yours C. F. Austin

Recd Dec 6th
Ans Dec 9th

Geological Rooms Albany N.Y.
Dec. 2nd. 1862

Dear Sir —

I received a letter from you last Spring containing some specimens of Callitriche. I got hold of Prof. Grays & Dr. Torreys specimens but found I did not begin to have material enough to draw up a monograph from. I took notes of what I found — I discovered that there were probably not more than a half dozen species in all the world — for I saw specimens from every quarter of the Globe. Callitriche verna L. C. autumnalis L.

C. pedunculosa Nutt. C. Marginata Torr
C. peploides Nutt. & C. Englehardtiana M.H.
were the only good species I
found. And I had some
doubts that the autumnalis
was a good species - the great
mass of specimens under
~~that~~ name were plainly
states of C. Verna - but
there were some sterile
or immature specimens
~~that~~ looked as if they
might be different.

I have a new species of
Pogonia ~~from~~ Bergen Co
N.J. also a new Pyrola
from Del. Co. N.Y. which
I will send you soon
My plants are not here.

I have found 4 species

R. lam
Bisch.
& R. -
Speci

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Nutt. th
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as above Ca
Ver
Dr. Engelmann.

te Tour
ralticana M.Sh.

Of Riccia this Fall not supposed to grow in this Country. R. lamellosa Raddi. R. ciliata Bisch. R. nigrescens Mont. & R. — sp.? Will send specimens.

My Sphagnum Sullivantianum is Sph. Portoricense Hampe in Linnaea for 18.45 & 56 I believe — (Either 1845 or 56)
Linnaea vol 24 (1852) p. 359

I enclose the specimens you sent me with thanks for their use. The n. sp. is nearer to ~~of~~ C. pedunculosa Nutt. than to any other sp. it is between it & C. peploides but is very distinct from the latter

If you should have occasion to write me direct as above care of Col. E. Jewett.

Very truly yours C. F. Austin

Dr. Engelmann. St. Louis Mo.

P.S. the N. Sp.
is named in
honor of Prof.
Engelhardt of N. York
city who was with
me when I first
picked up the
plant on Staten
Island.

C. F. A.

W

Linnaea vol 25 (1852)
p. 359

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Recd March 20th
Closter N.J. Mar. 15th. 1864.
Ans March 25

Dear Dr. Englemann, - I have got about through with my observations on Callitriche and would like to publish them, could not your society be induced to do it for me?

I make out 6 species Viz:

1 C. verna, L. which appears to inhabit every part of the Habitable portion of the Globe - is quite variable but not to be confounded with C. Autumnalis - which is often the case - nor with any other species, - includes many nominal species founded upon unimportant variations of the leaf and fruit as to shape and size merely or upon size of the plant itself. among them are the C. heterophylla, tenuifolia, linearis and brevifolia of Pursh. C. terrestris, Raf. C. Platycarpa and-

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C. stagnalis, Kutzg. C. pedunculata D.C. [the C. sessilis DC. is an Elatine!!! Vide Herb. A. Gray (I have forgotten the species)], C. pedunculosa Arnott. C. aquatica Kutz.

2. C. autumnalis L. ~~Readily kno~~
Throughout the higher latitudes of Europe and North America, Readily known by its bright green leaves with a roundish constricted base and a rather broad ~~em~~ emarginate apex with a crescent-shaped sinus, they are also all alike; short linear inclined to lanceolate much broader and shorter than the immersed leaves of C. Verna and without impressed punctures. The fruit is also quite different from that of C. Verna though apt except upon close examination to be confounded with the European

forms of C. Verna, ~~the~~ ~~[illegible]~~ but usually is much larger and entirely without or with indistinct impressed punctations;

= deflexa A.Br. var. ?

3. C. pedunculata, Nutt. of the South Western States known by its fruit being thickened in the centre and on the keel, and raised on a ~~the~~ long thread-shaped peduncle.

Bot. Whipple p. 135 not in Hegelm.

4 C. Marginata Torr. of N. Mexico and California known at once by it mostly broadly winged fruit ~~so~~ the wings thickly studded with short rays like the spokes to a wheel, raised on a long strap-shaped peduncle.

= deflexa A.Br. var. fide specim.

5. C. Engelhardtiana n. sp. Inhabits the southeastern portion of New York. New Jersey. Ohio. Tennessee Arkansas. Louisiana and Texas

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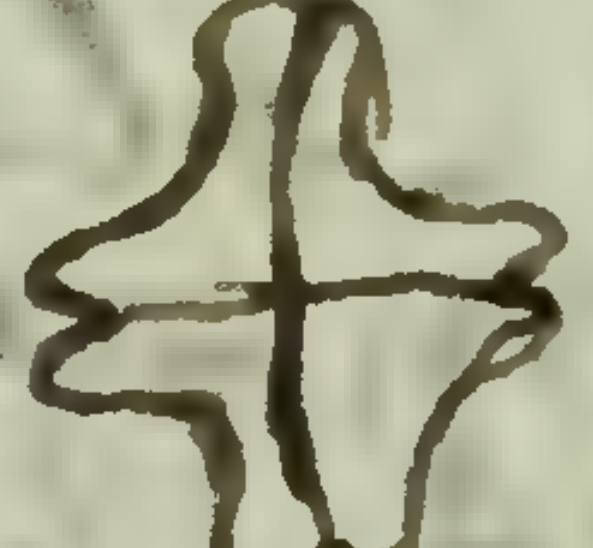
readily ~~-~~ known by its small creeping habit. (minute) broad and thin, flat fruit with an echinate membranaceous keel easily separable (into its 4 nutlets), raised on a short. but distinct peduncle.

C. Drummondii Hegelm

6. C. peploides, Nutt, — Inhabits the Southwest, from Tennessee to Texas. Known at a glance by its small erect habit, minute, sessile, easily separable fruit which, seen from above, has a cruciate (or stellate) appearance  caused by the curving (and twisting) of the lower portion into a plane at right angles to the upper. The styles are also much shorter than in any other species.

I would like very much to produce figures of all these but am no hand with a pencil myself and have not the means to procure the proper assistance in that line.

I have also a new Pogonia and a new Pyrola that I would like to describe and will send specimens of them together with a var? of Lechea minor which I have always found labeled L. Major, L. in all the herbaria in which I have seen it. It has the leaves and habit of that species but the pod is very different being like L. Minor but the distinguishing mark is the two little bractlets on two of the three sepals being prolonged beyond the sepal. It may be a new species but I am not sure it is more than a var of L. Minor, L. that has heretofore, on account of its oval leaves and general appearance, been con-

6) -founded with L. Major, L.
I also send specimens of Pogonia
verticillata (single and double)
flower-and fruit; Isoetes Engelmannii, and Botrichium
simplex; together with a
set of the Sphagna of N. Jersey.

The new Pogonia is related to
P. verticillata but is 1/2 shorter
but full as stout of a pale
ever glaucous green throughout,
with a pale yellowish the flowers
often two together, the sepals
are but little longer than the lips
the crest of which extends in
diverging lines to the apices
of the lateral lobes. In the
same locality it flowers

about 10 days later than P. verticillata the leaves appearing a little before the flowers and ~~to come~~ (are at first) drooping ~~at first~~ but gradually become horizontally spreading. The mature fruit is very short stalked and the leaves are narrower than in P. verticillata; which is of a dark green or purple hue throughout the crest of the lip occupying only the central portion, &c.

The new Pogonia is a queer thing with leaves different from any other species described in the books and the petals are unlike any thing else in the whole suborder ~~of that~~ to which it belongs, being acuminate! The plant is immature and I only succeeded in finding 4 specimens and the one I send you is a very poor one but the best I have to spare wanting to keep a good specimen myself. The other two I parted with sometime ago. It must be borne in mind ~~that~~ none of the flowers were open when I found the specimens but impartially opened afterwards in some damp paper in which I kept them for a few days for ~~that~~ purpose. It was a very thrifty fine looking plant of a dark green color. differing from any other species I have seen in ~~that~~ respect alone, I have a very remarkable Var. of Thalictrum Cornuti if not a good species, which I want to send you in my next.

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By the way what have you in Hepaticae. Messers Sullivant and Lesquereux have promised to send me their Collections and I am to put them up after the plan of Musci Exsiccati Bor. Americani.

I would like to recieve again those specimens of Callitriche I returned to you as you say you do not need them. I would also like to see some more European specimens of C. verna, Have you any? Those specimens of C. autumnalis you sent me were very acceptable and are much prized.

Very truly yours C. F. Austin

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Rec'd Aug 13th 64
Ans Sept 2

Closter Bergen Co. N.J.
Aug. 6th. 1864

Dear Dr. Englemann,

I wrote you some time last month in reply to yours of a recent date and enclosed a (fine) lot of Callitriche Englehardtiana. Hope you got my letter. I now send 9 specimens including Callitriche Asagrayi (I presume) 2 or three forms C. hamulata ?; C. Englehardtiana. C. pedunculosa. & C. Marginata. also C. autumnalis L. ~~[illegible]~~. the two last mere fragments. the very last not in fruit the other in fruit but fruit smaller and less broadly winged than usual.

C. autumnalis certainly grows in British America as Dr. Gray has fruiting specimens exactly like your European ones, and the fragment I send from L. Superior is also the same. the leaves are not to be mistaken for those of any other species I have seen. You will see ~~that~~ my n. sp. is very distinct from C. pedunculosa, Nutt.

I do not believe in C. Asagrayi. Think it a form of C. hamulata And that may be only a form of the old C. Verna, L. There are too many — as Dr. Torrey would say — "betwixts & betweens".

The Specimen you sent from Teneriffe looks much like what I have seen in Dr.s Gray & Torrey's Herbs. as C. Platycarpa. is that & C. Stagnalis Kutz. all one And the same?

The Specimen I send from the

Hackensack River (No 4.) is invariably and constantly entirely submerged - no part of it coming to the surface of the water - grows in running water 2-6 feet deep. Whether it produces male flowers under water or not I have not yet determined, I am not able to detect the male flower on the dry plant.

I am trying to get together all the forms of Callitriche that I can so as ~~[illegible]~~ to be able eventually to limit the true species. So far I have seen what appears to be six good species from North America. and only two from other parts (these two also occur in N. A.) However there may be a half a dozen species included in what I

have called C. Verna L. &
~~[illegible]~~ C. Autumnalis L. of W
I am yet in the dark as
to their specific differences, yet
I am almost persuaded that *No. 1 & 9 are
specifically different from No's 2. 3 ~~[illegible]~~.
4 & 10

Very truly Yours

C. F. Austin

P.S. Of the specimens you have sent me
those I have designated by the numerals
1-4 inclusive ~~[illegible]~~ (and) what
~~[illegible]~~
I now send you under the name of
"C. Asagrayi ?" are undoubtedly ~~[illegible]~~
forms of one and the same species.
You have not yet sent me (from this country) anything
like my No. 1. But your "C. hamulosa"
from Sweden is very near it, yet there
is a ~~[illegible]~~ difference between them as
you will observe, the European plant has
rather smaller - more orbicular fruit with narrow
keels or angles -

C. F. A.

Recd Oct 13th
Ans Nov 13

Closter N.J. Oct. 4th. 1864

Dear Dr. Engelmann

Your letter of last ult. was recieved within a day or two after posting my last. and last evening I recieved another dated Sept. 28th. I ~~have been~~ was intensely interested with the contents of both and particularly with the latter, and the specimens contained are above price. I was particularly charmed with your figures of the fruit of Callitriche Verna.

You ought to have Dr. Torrey's Callitriche as ~~it~~ his collection is superior to Dr. Gray's - in some respects though generally inferior It contains Original Specimens of C. peploides & C. pedunculosa. Nutt. rather too much mixed together however. His specimens of C. peploides being mixed with both C. Engelhardt-

no doubt of his ability to see things correctly, and I should ~~fe~~ have great faith in his conclusions if I were sure he always looked; — as it is, unless he agreed with me, I could not have much. I say this candidly as to a friend of a friend.

ciana & C. pedunculosa. Yet if my memory serves me Nuttall's descriptions of these species are tolerable though not very definite. But the remarks he makes concerning C. peploides are quite pertinent. [see Trans. Am. Phil. Soc., N. Ser. Vol. 5, p. 141.] I have not the work by me in which they are described but this is the impression I now have.

Your advice concerning my Orchid is good enough ~~and~~ I should follow it if I thought Dr. Gray would look at the plant before giving his opinion on it. My experience so far would lead me to judge that he would not. For instance in 1858 I found specimens of Spiranthes graminea Lindl; and communicated them to him under the informing that it was S. latifolia as that was the only species described in his manual that I had not collected before. (I had seen this before but had not collected) He wrote me that it was S. Cernua. I again sent another specimen, describing it as well as I could and showing the flowers to be arranged in a single row &c &c. Also mentioned the time of flowering as being much earlier. In due time I received a reply that it was certainly S. Cernua. I did not believe it and as I had that season collected a lot of Orchids for him it seems I almost exterminated the species from the locality and for 2 years following I was unable to find it. In 1861 I again found it in the old locality, and took the pains to dissect a flower and dry the parts separately, and then waited patiently a couple of months for S. Cernua, which I served in the same way, and sent the specimens to him, directing his attention to all the points of difference that I could observe. (In the mean time I had shown them to Dr. Torrey who could see no difference between them even now!!!) This time Dr. Gray saw a difference! Neither he or Dr. Torrey could ever see any difference between those three species of Cuscuta I sent you — although I had sent them to Dr. Gray 2 or 3 times and had shown ~~the~~ to Dr. T. There are several other instances full as important in which Dr. G. has served me in this way. I have no doubt of his ability to see things correctly, and I should ~~f~~ have great faith in his conclusions if I were sure he always looked; — as it is, unless he agreed with me, I could not have much. I say this candidly as to a friend of a friend.

I now have the Thalictrum in fruit. but have not had time to compare it thoroughly with undoubted T. Cornuti; yet I have ~~[illegible]~~ compared far enough to observe a manifest difference. I will communicate a specimen ~~shortly~~ as soon as I can get leisure to examine the points of difference above designated.

The genus Callitriche once so obscure begins to appear quite clear; a few more letters like the last three from you and I should be able to almost Monograph it! You have already cleared up nearly all those puzzles I found in Dr. Gray's Herb.

I believe I once wrote you that C. Englehardtiana was more nearly allied to C. marginata than to C.

For 4 feet under water - never coming to the surface ~~in these cases~~ (P. hybridus never flowers or fruits at the surface here!!! although it is extremely common and is always without the floating leaves.

peduncular or in fact than to any
other species I had seen,—or account
of the seed being echinato-membran-
-aceous— I believe I have also observed
in my notes that these rays are a
continuation of the 2nd. coat of the seed
(call the spores the outer coat similarly the
cuticle of the stem & leaves) but had
not observed that they were simply
thickened cell-walls.

I am highly delighted with my
specimens of C. Verna. Believe
I never saw it before from this
country,—at least had not before
collected it. Will send a better
specimen of my No. 9 which is
no doubt the same ~~thing~~ as No. 1. It was
found in a half inch of water leading
from a little hot water spring along
the same brook.

Would you like more specimens

P.S. Since writing this I have obtained another form of Callit. with the Aspergy is from Brooklyn N.Y. have not had a chance to examine, but will enclose it.

P.S. I should have stated that ~~my~~ Callitriche No. 1 were certain array of the other things I have sent you - have plenty left of the most of them.

I have for a long time been desiring to look over my notes on Callitriche and send you some extracts, but I could not find leisure - shall do so however within a week.

I have always been sorry I had not named my n. sp. C. Engelmanni instead of C. Englehardtiana, but doubted the propriety of changing it as it so stands in Dr. Torrey's Herb. also in Herb. of N.Y. State. And since you are going to study up our species thoroughly it is meet you should find our n. sp. to describe it at least, and if you find no other I shall cheerfully grant the permission ~~desired~~ asked in your last to change it.

P.S. I should have stated that my Callitriche No. 1 was entirely terrestrial - you know last summer was a remarkably dry one. And the plant was growing several feet from the water. ~~[illegible]~~ No. 2 had also been left by the water. but evidently only a short time previous to my collecting it. No. 4. was entirely & No. 3 partly submerged. C. F. A.

I have been a while past devoted, nearly all my leisure to the study of Musci and Hepaticae. I now have about 200 sp. of the former, all correctly determined, and 80 of the latter, not quite all determined, several of them new. I now have 14 sp. of Riccia all from this country and only 4 of them described in Sullivant's Mosses. 11 of these 14 are from this place. I greatly need more material. Could not you send me some, if you ~~[illegible]~~: I would like to study up & return you your whole collection, and should be very grateful for any specimens you could spare. I want to get ready a little paper on these things soon.

The ~~[illegible]~~ specimens of Riccia lamellosa sent you last winter is mostly a very distinct species, the paper containing 2 sp. and the R. ciliata contains 2 if not 3 sp. I enclose a specimen of Potamogeton which would be P. Tuckermani but that the leaves are 1-nerved - and the stipules are ~~free~~ free from the not sheathing base of the leaf or it would be nothing near (P. pectinatus). It often matures its fruit

4 feet under water - never coming to the surface ~~in these cases~~ (P. hybridus never flowers or fruits at the surface here!!! although it is extremely common and is always without the floating leaves.

I have some fine specimens of Potamogeton - Sagittaria, Eleocharis & Sparganium. [illegible] &c. Would you like some? If so will send. Very truly yours C. F. Austin

P. S. 8th Oct. 1864

I have deferred mailing this in hopes of being able to get some more specimens of Callitriche for your friend. Have not been very successful but enclose what I have been able to obtain.

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Recd Octob 23rd
ans Nov 1

Closter N.J. 18th. Oct. 1844.

Dear Dr. Engelmann I have just finished copying off some rough notes I made up to March last on Callitriche, and if they shall prove of any use to you I shall be partly paid for the time and labor spent in preparing them.

They very incomplete, and I believe some of my most important ones have become destroyed. As I intended making all the observations over again, rewriting everything I was not so careful to preserve all my notes as I should have been if this had not been the case. I remember particularly ~~to~~ having measured with a Micrometer the nutlets of all the species mentioned in the notes. and observing about the boss - nerves - punctures &c. of the leaves & fruit, also that in some species at least the outer coating of

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the fruit could plainly be seen to be a continuation of the outer loose covering of the ~~[illegible]~~ plant stem & leaves.

There seems to be a constant character in the circumferential groove of the fruit as you no doubt have observed.

I last week found fine fruiting specimens of C. Arizonici of which I enclose a part. also one little stem of C. Engelmannii; (pardon me for the name and if it don't suit you you are at liberty to alter it.) The compliment is more than deserved and unless you particularly desire to name the species I should prefer it to stand so.)

I exceedingly regret ~~that~~ I am obliged to send you the "notes" in such a state, but I felt it a duty to send them and could ~~badly~~ ill afford the time ~~[illegible]~~ to get them even in such a poor shape.

Very Truly Yours
C. F. Austin.

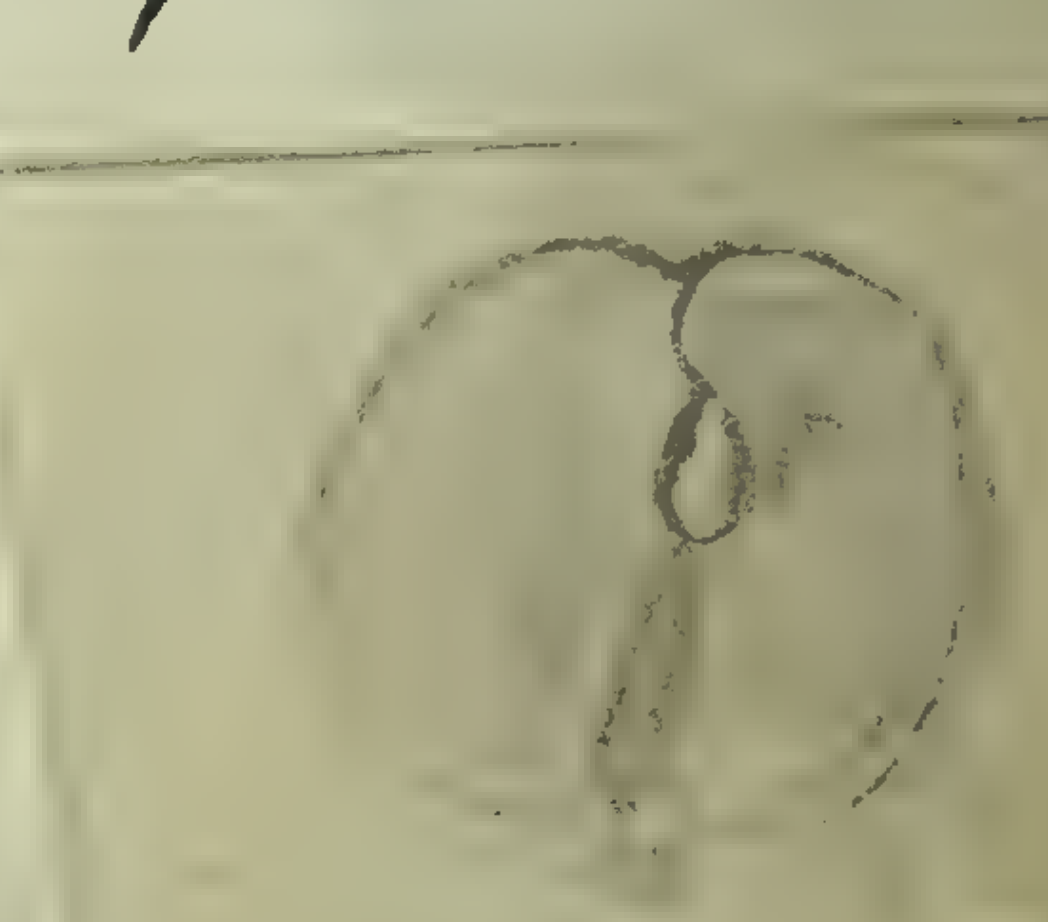
Recd Nov 11th
Ans Nov 13

Closter N.J. Nov. 7th. 1864.

Dear Dr. Englemann. For some time past I have been contemplating the project of critically examining my specimens of Callitriche (of which you have duplicates) and sending you the result of my observations. But I fear I have now deferred the attempt too long, for its consummation at this time, to be of any use to you: nevertheless I shall make the attempt.

I find no trouble in disposing of such Species as autumnalis L. pedunculosa, Nutt. Marginata, Torr. Englemannii, nobis.

Callitriche autumnalis, L. Berlin &. St. Petersburgh. Dr. Englemann, leg. Jefferson Co. N.Y. G.W. Clinton Esq. all agree in every essential (if not in every particular) point and have **Leaves** lanceolate=linear, lunulate=~~truncate~~ and slightly 2-horned at the apex, rounded and concave at the base. 1-nerved, dark green, of opaque small cells arranged in linear ~~[illegible]~~ rows. very narrowly margined. **Fruit** orbicular, over 1/12" in diameter, deeply emarginate at the apex the lobes approaching or even lapping over each other so as to close up the sinus; not emarginate at the base; - the keels very narrow, subpellucid (not rayed); ~~&~~ not pitted (?) as in all other species or ~~very~~ much more finely so, short peduncled or apparently sessile.



[In Dr. Gray's Herb. you will notice specimen "Leg. E. Fries" with fruit same size but broadly wing-margined.]

Inflorescence not obvious, styles short, reflexed, deciduous.

Callitriche truncata, Guss. Hab. Sardinia.

Leaves a little shorter than is usual in C. Asagrayi, Hegelm. but structure and shape exactly similar to the immersed forms of that species — rather suddenly dilated at the sub-clasping base. cells rather large and hyaline.

Fruit orbicular same ~~shape~~ outline and size as in C. autumnalis. less deeply emarginate at apex, the sinus not quite closed. short-peduncled bractless, coarsely pitted as in C. Asagrayi & C. marginata. the keels pellucid on the extreme border and with a dark line near to and parallel with the margin, the keels sharp, the circumferential groove broad as in C. hamulata Kutz. (E. Fries lg.) to which I should refer this form. in fact I see no difference except in the shorter leaves and very slightly enlarged fruit of the first Inflorescence not observed — styles short, deflexed, persistent (Fruit bractless).

C. hamulata Kutz., (Leg. E. Fries) [See under C. truncata Guss.]

C. stagnalis, Scop. (Teneriffe, lagunas on rocks Mar. 1855 — H. de la Perraudière)

This is (undoubtedly) the same as specimens in Dr. Gray's Herb. from Kerguelen's Land, Ant. Expd. 1839-43. J. D. H. also from Hermite Island. same Expd &c. of which I could find no fruit. As I have no specimens of C. platycarpa to which you refer this I do not examine it but from general appearance should judge it not far removed from C. verna. L. If I am not mistaken this has thicker leaves than the European C. stagnalis and is of a different color.

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Callitriche turfosa, Bertero   Chile I. No. 142. Bertero leg.

From the color, and thickish leaves and general appear of the fruit I should judge it not far removed from the last. but shall not examine closely.

Callitriche   No. 141. Bertero, is probably a peduncled form of the above - and is probably the C. pedunculata. Juss. The specimens are good and with good specimens of the latter at hand it would be easy to determine. I notice it has long thread-shaped persistent styles, in C. pedunculata the styles are very long and pendulous at first and are deciduous.? the peduncles (even in flower) quite long and stout. in the specimen under our consideration the styles are not deflexed at first. I see no difference between the fruit of the two last ~~in~~ and but little difference between them & C. turfosa.

C. pedunculata ~~DC.~~ [see above].

C. aquatica, Sw. in Andes Ecuador - Coll. W. Jameson 1847-9.
in Herb. A. Gray.   (No. 505-3.
If my notes are correct this ~~is~~ must be much as in C. Asagrayii, ~~the~~ particularly the fruit.

Fruit larger than in Asagrayi, and less plump, (thinner) oval or elliptical, rounded, but sharply keeled on the back. The keels convergent at the apex, ~~that~~ 0 coccis convergent at the apex, &c.

Callitriche verna. L. I send another specimen, (from Albany) with fruit a little more narrowly keeled than in those from Oregon. also specimen from this place - same as C. Asagrayi last sent. and same locality.

C. Asagrayi, Engelm. I send another specimen from near Albany N.Y.

Fruit smaller than in C. Verna &c. deeply emarginate at the apex - (Obcordate). Styles long erectish, persistent &c. I am not yet fully satisfied that this is distinct from C. Verna, and should not be surprised to learn that you had settled it as such.

C. Marginata, Torr. C. Macropteryx Engelm.? Can you not manage to settle wether these be one and the same? It is very probable they are.

C. pedunculata Nutt. C. Nuttallii Torr. C. deflexa Engelm.? I think with Dr. Torrey that Nuttall's names ought to stand for both this & C. peploides.

C. peploides Nutt. C. Drummondii, Engelm. The fruit is not bulged out at the base but the achenia are bent outward thereat.

C. Englemannii n. sp. (C. Englehardtiana formerly) C.? deflexa Engelm.? I send specimens of this collected on the 1st. of Nov. inst. found in a turnip patch.

I enclose a nondescript - can you tell me wether it is a Cryptogam or a Sponge? If the former it must be entirely new.

Very truly yours C. F. Austin.

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Rec.d Dec 24th
Ans. Jan 11

Closter N.J. Dec. 19th. 1864.

Dear Dr. Engelmann

I owe you an apology for not sooner replying to yours of 13th. ult. but have been very busy too busy to examine critically the specimens you sent but am of the opinion your perfoliata & heteropoda are forms of the same species - judging from appearance of the fruit only - but this seems to me as new one. The C. deflexa appears - in everything but the keels of the fruit - to resemble very closely C. pedunculosa and the fruit is nearer what I have formerly called C. Englehardtiana. The narrow pedicel at once separates it from C. marginata. Thanks for the specimens.

P. S. I did not presume my notes would be of any service to you except to call your attention to - possibly - a few points of more or less specific value; but I doubt not you [illegible] will see every thing worth seeing without consulting them.

I send you about all the C. Englehardtiana (I shall call it by this name until you decide wether it is new or not) I have — I found it a very tedious thing to collect. Spent time enough in collecting what I have, it would seem, to have been able to supply the (whole) world! Have plenty of C. Agassizii and fine specimens as you have seen. Do you want more? Will send more other ~~those others~~ plants as soon as I can get the opportunity.

I enclose the "nondescript" which was omitted in my last also in the reports package of the "Collectanea Austinii"

Very truly yours

C. Austin

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Mr. Sullivant sent me a small package of Riccias about 3 months, ago, by express - Have not yet heard from it, Mr. Lesquereux sent me a box by rail road which was a month on the route but I have recieved and sent not less than 40 packages by mail within the past year - all have reached their destination in due time!!! C.F.A.

(May 3rd. Mr. Sullivant's Package has been found at last. C.F.A.)

Closter N.J. Apr. 27th. 1865-
Rec'd May 8th

Dear Dr. Englemann:

Your letter of Jan. 11th. containing specimens was duly recieved and I have deferred its acknowledgement till this late date hoping to be able by this time to communicate something interesting on the Callitriche. But I have been too busy with the Hepaticæ to have accomplished much had ~~those~~ my opportunities been ever so good in other respects, but these have been very meagre.

In: "A Compendium of the Flora of the Northern and Middle States" by Dr. Torrey. New York 1826

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I find on p. 14. the following:

"Callitriche terrestris: procumbent, diffuse; leaves oblong, uniform, rather obtuse; capsule grooved on the margin.

Hab. On wet ground. Jun.–Aug. ⊙. — Creeping, small; leaves crowded; flowers polygamous; capsule very short, ☞ and broad." ☜ Raf!

In the New York State Herbarium is a fine specimen of ~~[illegible]~~ C. Austinii under the name (if I recollect rightly) of "C. verna var. terrestris. C. terrestris Raf.")

From this it would seem that Dr. Torrey had as early as 1826 examined your C. Austinii and regarded it as the C. terrestris

(And Dr. Torrey seems never to have understood the difference between it and the terrestrial one of

C. verna: nor even probably between it & some other terrestrial species.

And Dr. Torrey seems never to have understood the difference between it and the terrestrial one of

Of Rafinesque, — which I have but little doubt it is — yet unfortunately for ~~his~~ Rafinesque's name, as you have observed — his description would cover any terrestrial species or variety. — So much for this, But by the way there is a larger Ed. of Torrey's Bot. which might be still more to the point, but I do not have it & probably you have both Editions.

I have been told by a very intelligent Gardener in New York that a small plant resembling a Callitriche is something of a pest in the pots in Stewart's Conservatory Cor. 20th. St. & 5th Avenue N. York, but have not yet had an opportunity to investigate it, but believe the Callitriche Austini will be found [illegible]

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plentifully in all connections;
from its peculiar ## Habitat here.
it being a damp ground out of
the reach of drying wind. I will
try and investigate the matter this
summer if you think it will be
worth the while.

Intend to put you up a package
of such things as I think will interest you - at the end of the
present season. Shall collect more
of the Callitriches.

Many thanks for the Ricciae &c.
will return some of them shortly.

Should be very thankful for the
loan of your Collection of Hepaticae - Please
send by Mail if possible as that
is much ~~cheaper~~ safer than by Xpress.
~~[illegible]~~
~~[illegible]~~
~~[illegible]~~ I deposited a package
of Mosses & Lichens in the New York
Post office, not long since, weighing 3½ lbs -
(postage. 28 cts.) It reached its destination in Ohio
in due time. Very truly Yours C. F. Austin

Rec'd Jan 5th
Ans Jan 7

Closter N.J. Jan. 1st. 1866

Dr. Englemann

Dear Sir:

I send you by mail a small parcel of plants, one or two for determination.

I have not yet had an opportunity to look up some more things I want to send you, but hope to get the time soon.

Should you want any more specimens of any of the Callitriche, I have plenty to spare.

I have your Riccia yet all safe ~~but~~ and will return it soon.

I would like your opinion on the Cerastium It has no petals! Also on the Lobelia which has no root=leaves.

Very truly yours

Coe F. Austin

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C. F. Austin

Recd Jan 22d
Ans Feb 4 Closter Jan. 13th. 1866 —

Dear Dr. Engelmann

Your letter with specimen of Callitriche from rocky cliffs of the Mississippi &c. is recd. I collected this species last December a year ago in a sunken place in a Turnip patch and found one fruit on it. It appears not to mind freezing much — like C. Grayi which appears to flourish all winter in swamps &c. here. but does not fruit usually till Mar. or April nor later than Nov. & Dec.

I am right glad you have taken hold of Juncus. I once attempted to study this genus and got through with it according to Torrey's Fl. N.Y. & Gray's Manual. but was never satisfied. I have a great many specimens of most of the species peculiar to New Jersey. particularly — I suppose of your new one.

Nuphar Kalmiana Pursh Herb.
I have collected it several times. I think I have seen Flowers of N. advena — which is very abundant here — of a reddish tinge but cannot me

P.S. I have some fine sp... of Juncus.
I cannot make out the name of the Newark Botanist! is it Rev. J. A. Paine jr.? what is his address?

answer your queries further. Will try to look out for ~~the~~ things next year.
N. advena is usually—at least—yellow here.

Have a great many things that would interest you, when I can once get the time to pick them out for you. Lemna. ~~Potamogeton~~. Sagittaria. Gramineae. Fraxinus. Etc. Etc.

Would you like some of the New-Jersey Pine Barren plants? I have a friend who is a most elegant collector, and an enthusiastic if not a clever Botanist. And he would like to exchange New Jersey plants for Southern & western species. Or if there is anything he can do for you the exchange is no matter. For he is as good a fellow as one can meet in thousand miles. and liberal to a fault.

Very truly yours C. F. Austin

I have nearly or quite a hundred of N. Eng. most of the Juncei I have met with.

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Rec'd Nov 20th
Ans Nov 25

Closter N.J. Nov. 15/75

Dear Dr. Engelmann

I send you a package containing about all the species of Juncus in my possession. Shall be greatly obliged if you will name them and return a little out of each in the paper marked "Herbarium specimen." I ought to have attended to this before but I have so many 'irons in the fire" some of them must "burn."

Did I ever send you those promised specimens of Potamogeton &c? If not will do so as soon as I hear from you.

Very truly yours

Coe F. Austin

Chen. oppositifol

Chenop. hybrid

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Rec'd Dec 14th
Ans Jan 7

Closter Bergen Co. N. Jersey Dec. [illegible]

Dear Dr. Engelmann

Yours of 28th ult. is rec'd. Sam's Point is the highest point of Shawangunk (pronounced Shongum) Mountain in N. Y. State. 10-12 miles west of the Hudson River and about 5 miles S. E of Ellenville on the Hudson & Del. canal.

I will look over my Junci again soon and see if [illegible] what you want. Of course it is too late to collect.

Orange Co. is in N. York State. west side of the Hudson. 50-60 miles north of N. Y. city. The locality of the Ju. specimen sent you — Orange Co. is Bog meadow near Brookfield Orange Co. N. Y. Jul. 1864.

Sorry to say I never got the

copy of St. Louis Transactions
of which you speak. I
got vol. 2nd. No. 1 2 or 3 years
ago — and I recollect ~~that~~
that the wrapper so worn off
when it reached me that I
wondered I ever got it at
all.

Will do all I can to aid
you in your Junci but that
is not much. Shall be very glad
to receive ~~the~~ copy as you promise.

I have done nothing lately in
Callitriche — find nothing
new.

What have you of Lem-
-na. I would like very
much to see your specimens
as I am going to study
~~them~~ the genus perhaps up for Gray's Manual.

Very truly yours C. F. Austin

Recd Jan 4 1867
Closter N.J. Dec. 29th. 1866
ans Jan 7 & 28

Dear Dr. Engelmann

I wrote you to send me some Lemna several days ago but have not yet heard from you.

Should like very much to see what you have got before closing up - which I shall have to do very soon. Should like to see All your N. American species & forms at least and such ~~[illegible]~~ your foreign ones as you may choose to send.

I find we do not have the L. Gibba of Europe nor the true L. minor. Nor the L. arrhiza (Wolffia Schleid.) but we have various forms of L. minor (L. perpusilla Torr. L. trinervis mihi*) &c.) and a n. sp. of Lemna proper intermediate in its character of vegetation between L. trisulca & L. minor. And a n. sp. of Wolffia.—very different from W. Michelii

I found to-day in L. minor
(from N. Mexico & other places)
the pollen grains to be mixed
(in the anther) with innumerable
'spicula' like the Desmidiaceae
about as long as the pollen grains
and very slender & smooth.
And in a N. York specimen I
found the pollen grains smooth!
And the sac filled with a number
of small globular spore-like bodies
all exactly of a size and perfectly
globular! The plant is sometimes
dioicous! — My specimens from
Pennsylvania appear to be entirely
so. (I call this L. minor var
trinerva. The seed is erect anotropous Dr. Torrey's?
Torreyi
L. perpusilla is smaller with the seed
about 3/4 ± anotropous.)
My Closter specimens belong to a
n. sp. which I call L. Torreyi.

Very truly yours
C. F. Austin

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Rec^d Febr 11th
Ans same day

Closter Feb. 2nd. 1867

Dear Dr. Englemann

I have just received yours of 28th. ult. I had completed a reply to your former favor of 7th. ult, but luckily had not sent it.

Concerning the Lemna:- in 1859 I found a species growing here which I took to be L. perpusilla I sent it to Dr. Torrey and he called it that species - in 1860 I found what I took to be L. Minor, in Pennsylvania, abundantly in fruit - Dr. Torrey called this the true L. perpusilla and said he thought my Closter specimens were the same but he could find no flowers in them. I sent him some more in which he found the fruit. he then wrote me that L. Minor was very different from my Pa. specimens in that it has the seed half-anatropous while the latter has it anatropous, and he further pointed out some of the characters of the seed in the Closter specimen which he thought

of it under this name about 2 years ago! CA)

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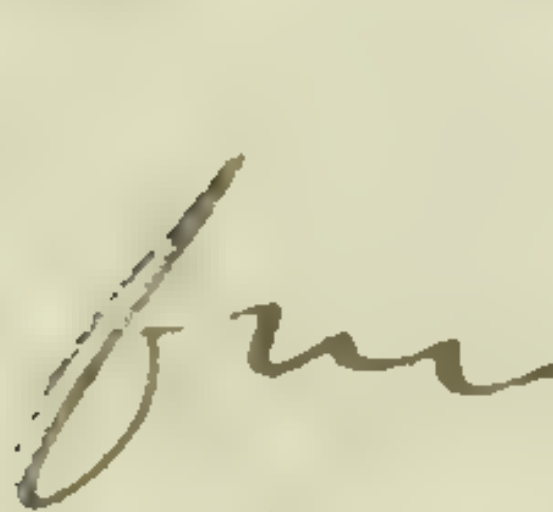
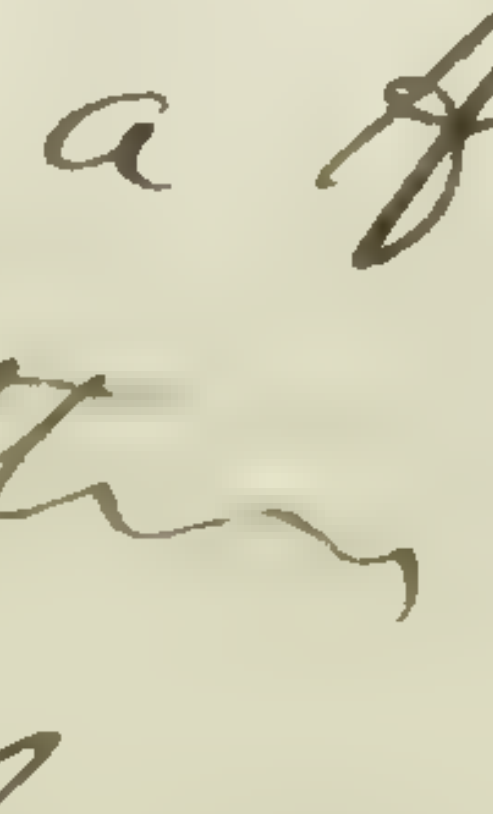
remarkable, and said he considered it a "state" of L. perpusilla (he did not notice the arillus). I then examined his original specimens of L. perpusilla and found ~~that~~ ~~it~~ they were different from both of ~~mine~~ my, specimens. I found the seed to be not anatropous as in both of mine but about 3/4-anatropous and I could not see the "striae" on it.

I then called the Pennsylvania specimen L. trinervis and the Chester specimen L. Torreyi. This was in 1864 or 1865 and after I had sent you "L. minor" (L. trinervis) & "L. perpusilla" (L. Torreyi)

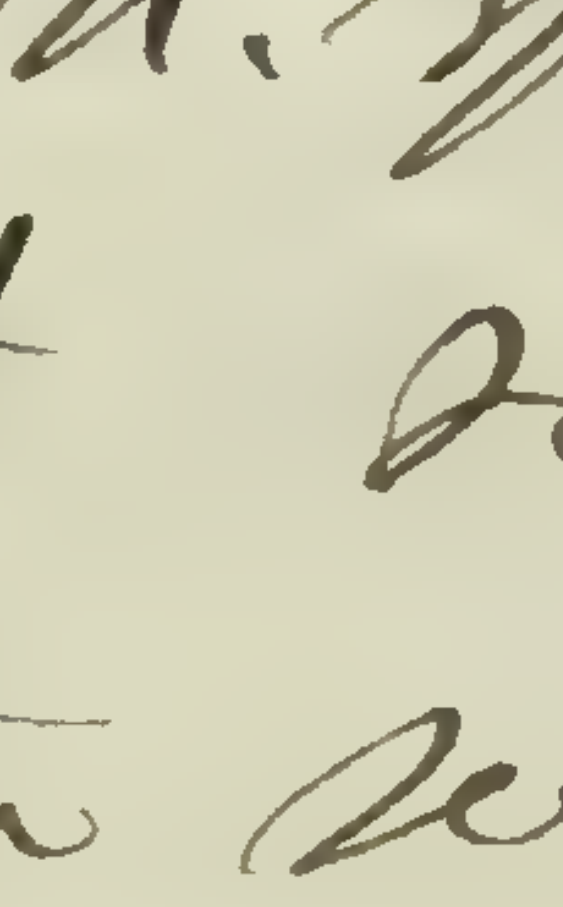
L. Torreyi is a fine n. sp. differing from all others it seems in the thick arillus of the seed; ~~and~~ in the 1-nerved fronds it resembles somewhat L. trisulca.



Seed of L. Torreyi

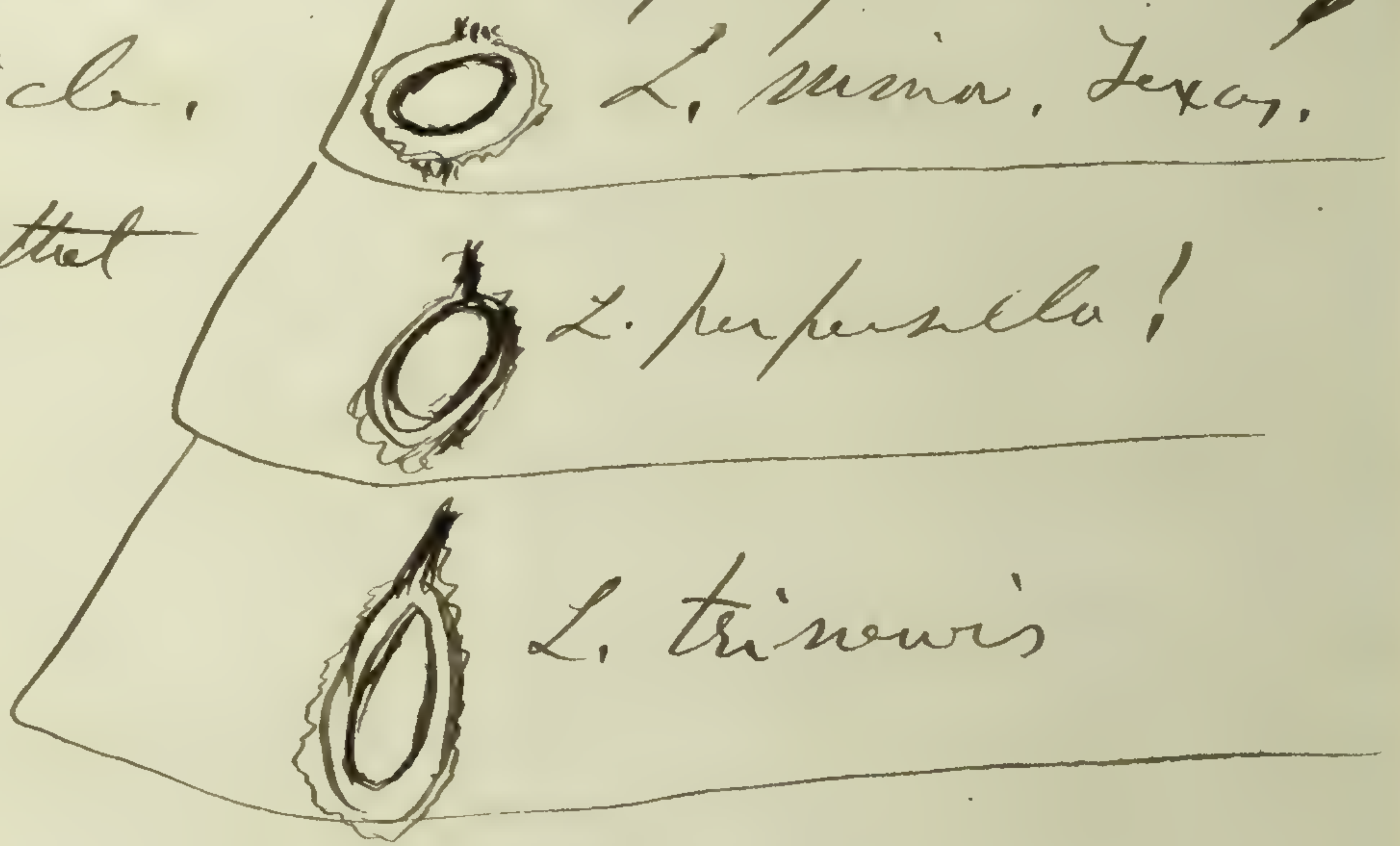


Seed of L. perpusilla



Seed of L. trinervis

I find no true L. minor from N. America except Texas & N. Mex. (Wright,) and this has the seed half-anatropous or lying rather obliquely in the utricle. I have concluded that L. perpusilla & L. trinervis are varieties of L. minor.



L. trinervis has the frond distinctly 3-nerved - but so has L. minor from Texas. And L. perpusilla has it often rather distinctly 3-nerved and in L. trinervis I sometimes find the fruit almost as oblique as in L. perpusilla. It is remarkable that, among all your specimens, Dr. Torrey's, Dr. Gray's, Durand's and Eaton's there should be not a single specimen of L. minor from Europe!

I think I once sent you strike "L. minor" from the Hackensack Meadows. I now call this

the N. American form of L. gibba - scarcely tumid underneath,
I am inclined to think this form occurs also in Europe where it passes for L. minor oftener than otherwise

My "new Wolffia" is W. Delilii no doubt - though Schleiden says "frondibus tenuissimis" which is no doubt a mistake.

I have a n. sp. of Wolffia from Cuba nearly as large as L. trisulca or L. polyrrhiza

I send a list of the names of your speci-mens - if you sent the same things to Hegelmaier he must have L. perpusilla and some other things which he has not noticed.

I send some notes and specimens which I should like you to forward to Hegelmaier at your earliest convenience.

I also send some specimens for you to keep.

I have not yet rec'd the (package of) Juncus

Very truly yours C. F. Austin

P.S. I have about completed my paper on Lemnaceae and stick to L. Torreyi. I sent Dr. Torrey specimens & description

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Rec^d March 2^d
Ans May 1^st

Closter N. J. Feb. 25th. 1867

Dear Dr. Engelmann - Yours of 11th. inst. is at hand.

I have always considered the first 3 var's of Callitriche verna in Torr. Fl. N.Y. as forms or states of C. Grayi but am positive that the 4th. is C. Austinii, for a specimen in the N.Y. State Cabinet of Albany under ~~that name is~~ Var. terrestris &c is certainly C. Austinii - But Pursh's brevifolia I have always taken to be a terrestrial form of C. Grayana, or C. verna probably the former.

I have found C. Austinii in a flower pot in a green house in early spring and have no doubt it may be common in such places. Neglected to look for it in the proper season.

Specimens of Dr. Torrey's Lemna perpusilla (Collected on Staten Island in 1829) are all one thing - or rarely passing into the var. trinervis. I have specimens from Staten Island collected by Leggett

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in 1864 some of which is quite like
var. trinervis;

You had sent me L. gibba
before & ample & fine!
but not L. minor.

Your L. minor is sterile I am
sorry to say. The fruit is what I
am greatly in need of. for I found
from Texas (Herb. Gray) what I called L.
minor Coll. by Wright, which
had the seed half=anatropous - apparently -
I did not destroy the only specimen
that was in fruit - and your own
specimen from N. Mex. Fendler are in
flower and have the ovule half=anatro=
=pous! But these fronds are thinner
than in L. minor (your own specimens) and
of a different shape & very distinctly (for
a Lemna) 3=nerved. The seed is also smoother
(I think) - and not (costate) as figured by Brongniart
So this may be a n. sp. I return the L. gibba
Post sent. Many thanks for the L. minor.

Very truly yours C. F. Austin

Rec'd Aug 5
ans Aug 13

Closter N.J. July 30/67

Dear Dr. Engelmann

You were right in presuming I would be pleased to find Wolffia arrhiza in your last (July 9th.) I had before found it in some of your Missouri Lemna but very scattering - and as I also found in the same paper fruiting L. Gibba ~~[illegible] [illegible]~~ (a few fronds) Exactly like your European specimens I thought they must have accidentally got there and therefore did not mention it in my notes to Gray).

I forget about the shape of W. Columbiana in the fresh state. but it is concave above when dry.

Your small Lemna is what Hegelmaier calls L. minor and is my var. orbiculata of that species.

My W. maxima is not new. I forget what Hegelmaier calls it.

I fear I shall not be able to get those Juncus you want as they do not grow about here.

Wolffia Columbiana does not grow about here to my knowledge. Thought I had sent it to you.

Very truly yours
Coe F. Austin

P.S. I send a var. of Juncus tenuis which was ~~with~~ in the package you returned. but seems to have been overlooked by you. How is it?

A.

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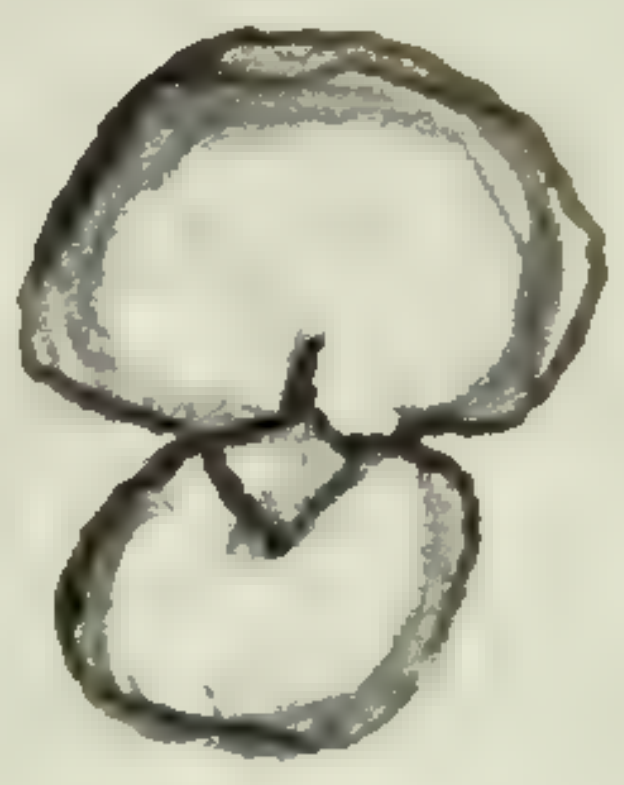
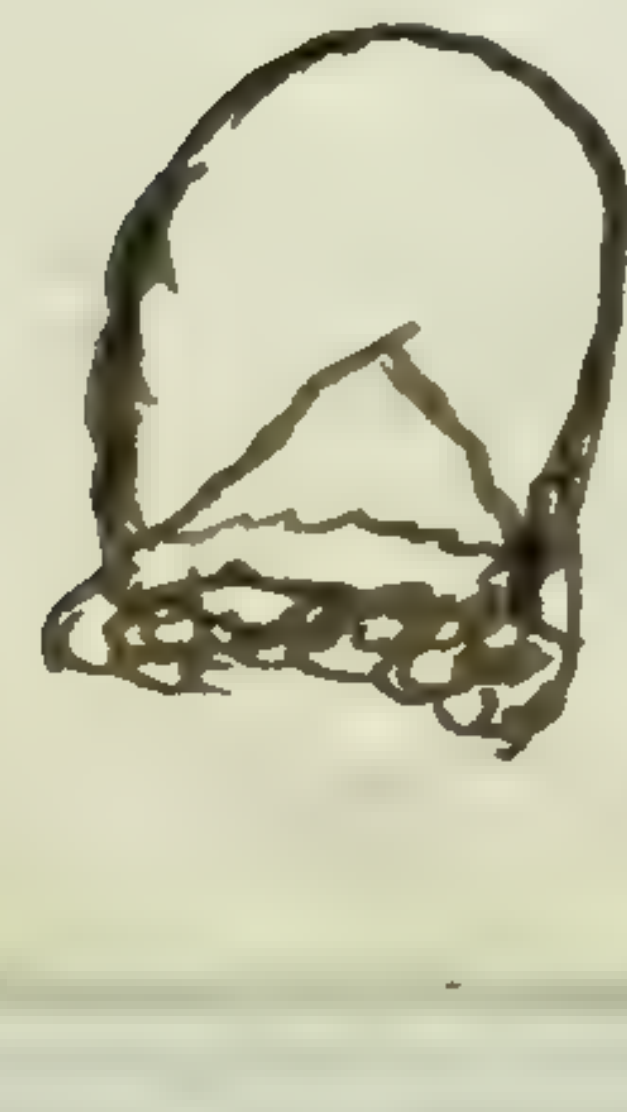
Rec^d Sept 3^d Clinton Aug. 20-67
Ans Oct 25

Dear Dr. Englemann

Yours of 13th. is rec^d. with specimens - I have just taken a look at these and so far notice two species one is the same as I sent you under the name of W. Columbiana Kars. the other is what I had supposed to be W. arrhiza - but it may be different. The frond is somewhat ear=shaped and there are usually two united together - but the young frond originates much nearer the margin - (is not so much included within ~~the~~ the substance) of the parent frond. However this appears to be the true European W. arrhiza





W. Columbiana &

I have not been able to detect a single frond of W. arrhiza from Orange Co. N.Y. but will look again - the plant is certainly mostly not that species! - I only have Hegelmaier's word for it that it is W. Columbiana Karsten. I at first called it W. vesiculosa and afterwards W. Robbinsii. I did not examine the plant while fresh, but Dr. Robbins says it is lenticular; - when dry it is concave above!

I have never seen Karsten description or Fig. The plant I described certainly has the chink appendages ~~ix~~ and ~~appears to~~ Robbins says it is lenticular before it is dried.

I found a single specimen of a wolffia among Bigelow's

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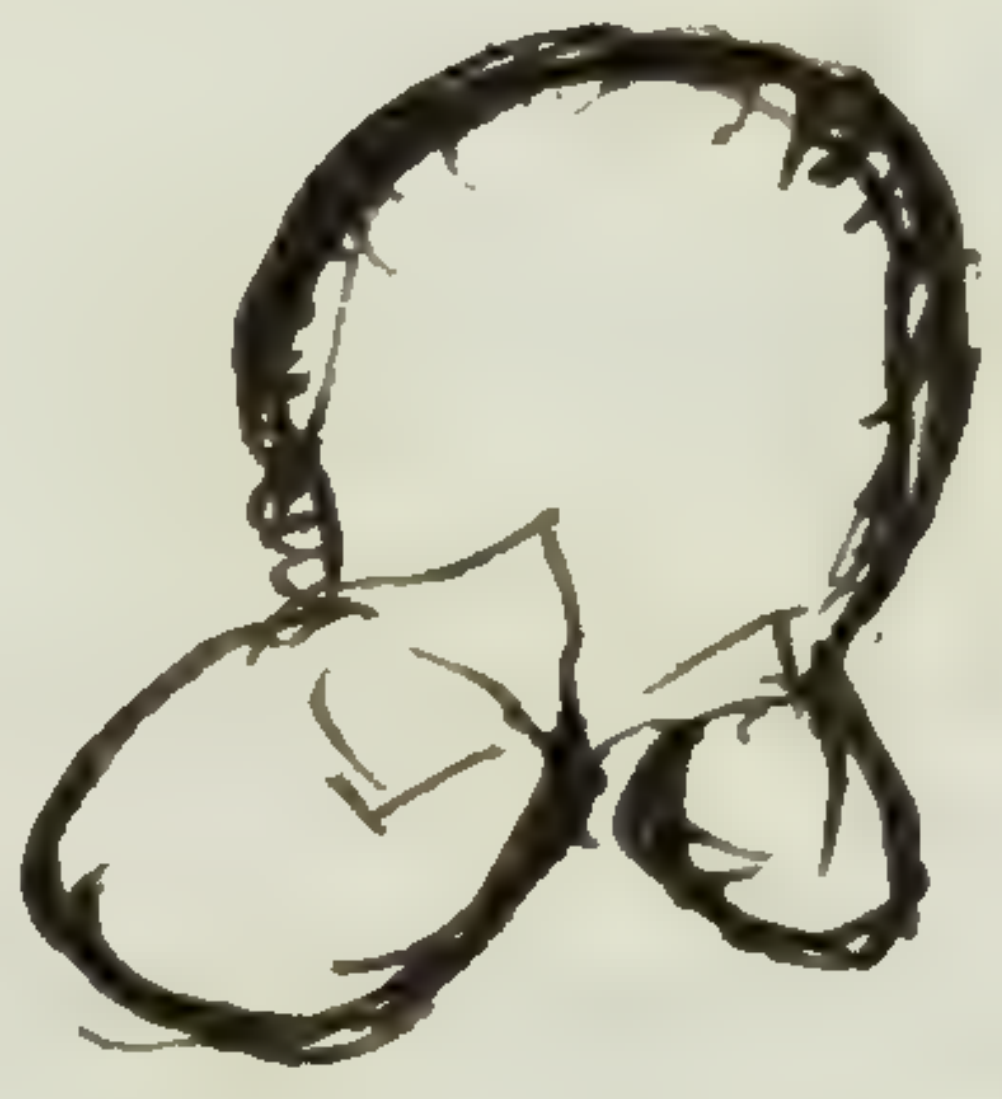
Lemna Torreyi from
California, it was
much smaller than
W. Arrhiza and prolif-
-erous from both sides near
the base. I called



it W. Califor-
-nica
that is all I can
say of it.

I think Dr. Gray has Karsten's
Description of W. Columbiana.

I will reexamine
my Wolffias and
report soon -

The Junci you want
do not grow about here
Parker must get
them for you.

I am just now engaged on my Musci - I have one n. gen. & about a dozen n. sp.

Very truly yours

Coe F. Austin

Aug. 30. Will send you some specimens next week. Dr. Gray I presume has Karsten's ~~Fl~~ Description of N. Columbiana

CFA

Rec^d Sept 3^d
Ans Oct 25

Closter Aug. 25. 67

Dear Dr. Engelmann

I wrote you a week ago but was so busy with my musci ~~that~~ I did not send. Yours of 24th is just rec'd with Lemna perpusilla. You never got Wolffia stuck fast to paper from me. – at least it was not collected by me.

I guess what you call W. arrhiza is only a small form of Lemna minor. ~~The true W.~~ and I have suspected this to be Linnaeus' L. arrhiza. It is much larger than what I call the true W. arrhiza – ~~which you call W. arrhizoides~~ is.

I have never seen but one form or species of Wolffia from Europe (W. arrhiza) and you sent the same thing from St. Louis & I found it mixed with some of your ~~the~~ L. perpusilla &c

but thought it might have got in from some of your Ephemerum specimens. But the lot you sent from St Louis settles the matter beyond doubt. There is none of this (that I have ever found) in the Orange Co. specimens.

I do not expect to find any Bruchias here this fall. On account of the continued unprecedented heavy rains of the summer. Everything has been constantly overflowed and washed the ditches and the [illegible] have all gone down stream it appears. I find I have now about 280 species of Musci from N. Jersey. Among them are 2 new Barbulas. 2 Orthotricha. 1 Bryum. 1 [illegible] n. gen. of which we have 2 sp. both from N. J. only. 1 Leskea. 1 Omalia and 7 Hypnum. besides quite a number of things new to this country and latitude.

Truly yours C. F. Austin

Recd Sept 12
Ans Oct 25

Closter Sept. 7th. 1867

Dear Dr. Engelmann

I regret that I could not find time to thoroughly reexamine all my Wolffia

I have examined the specimens last sent by you sufficiently to identify them as belonging to the species collected by me last summer in Orange Co. N.Y. I find 8 seeds which may belong to them – which I return –

I was satisfied at the time that the former specimens sent were W. arrhiza – but this may have been a mistake and I have not time to reexamine now.

I leave the thing in your hands for the present

and hope you will succeed
in finally settling the species.

The mosses occupy all my
leisure time now. and I could
spend a year to advantage on
what I have accumulated in this
line.

My latest discoveries are a new (?) Weissia
or Barbula, a ? Didymodon, a Bryum
a Mnium? a Hypnum or two. All
doubtfully new. but appear to be new to us.
I also find a sterile Moss the leaves
of which are broadly lamellate in the
middle ~~above~~ on the upper side, unlike
anything else known to me. And that
the leaves of Hyp. hispidulum, H.
Molluscum & H. Novae Angliae
are subpapillose - often distinctly
so.

Some of the Lemna mixed with your Wolffia
looks like young L. gibba.
I enclose my "Carte" Should like very much to see yours.

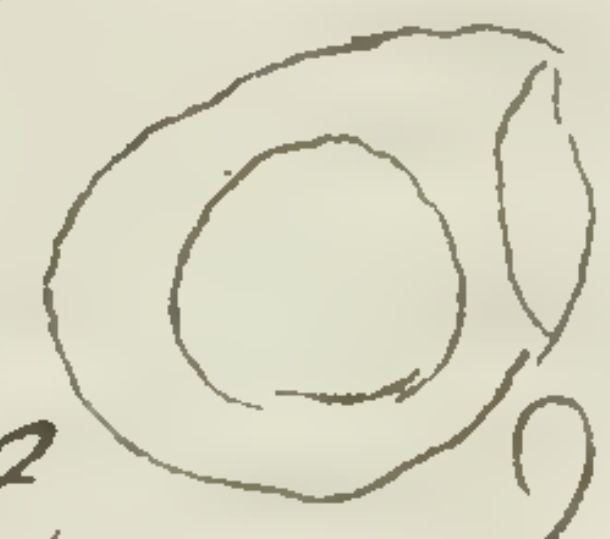
Very truly yours C. F. Austin

Recd Nov 5
Ans Nov 7

Closter Oct. 30th. 1867

Dear Dr. Engelmann

Your letter of 25th. inst. is just rec'd. I have been waiting to see what you would make of the Wolffias before again looking at them. On Saturday last I went out for the purpose of getting some Lemnas which I wished to keep growing during the winter, and the first pool I came to had a little patch of a Wolffia floating on it, among a lot of bush and weeds. I succeeded in getting a few granules which I now have alive and was not long in satisfying myself that it is the same plant I last year found in Orange Co. The fronds are truly globose-oval as you say. The border of the chink (or rather cavity) is expanded only in the previously dried and then soaked specimen. It is however hyaline on the very border, and composed of much elongated transverse cells. This cavity is much larger than in W. arrhiza, and after shedding the (about mature) offshoot a second young one may (always?) be found in the same cavity (This also occurs in the Lemna) The fresh plant is full twice the size of the previously dried and then soaked one, and has a quite a different look. My fresh specimens abound in starch(?) granules. I have not yet ~~looked for pores or stomata, but tried to find the upper surface and think I succeeded, for rolling the frond over under a thin glass it present, a ~~th~~ small spot~~



~~which appears have a slightly different structure from the rest of the frond. I also found by making the side found uppermost in the water and then tumbling the plant about in the water that the same side invariably came uppermost.~~ Yet I consider none of these things final.

The plant first found struck me as presenting a different appearance from the European species, which I ~~thought~~ were darker green above and sometimes purple underneath. The fact is I was away from home and did not look much at the species - only taking good care to get a lot of the stuff well dried, thinking that as in Lemna dried specimens were about as good as any!

I certainly found Wolffia arhiza among some things you sent me ~~fr~~ from Missouri but concluded ~~that~~ it came from Europe - for the grains were not sticking fast to the Lemnas - were very few in number & there were also a few fronds of your European L. gibba in the same paper!

It appears to me I settled those "seeds" as belonging to Lemnas.

I have found the "spots" on L. polyrrhiza from N. Durham N.J.

The California frond was much smaller than W. Columbiana, lenticular and solid. — a new spec! The buds adhered rather firmly to the old plant.

Should like very much to see W. Arrhiza growing on my table; will send a little of my W. Columbiana along with Lemna Torreyi.

The fresh fronds of W. Columbiana are very crisp or brittle. The color is uniformly pale green all over. There also appears to be 'specs' of a dark color in the epidermis on all sides. I will reexamine tomorrow & see if I can resolve them. I am unable to resolve the spots. They appear to surround the stomata forming little patches of an irregular shape. composed of minute granules.

Stomata very numerous!

Think I have sent you about all of my new things, excepting possibly Spiranthes simplex — which by the way I sent to

Dr. Gray with notes – a fine lot of specimens – some with the radical leaves – in 1858! along with Spiranthes, Grominia & Pogonia affinis. I am sure I sent you the Pyrola oxypetala box I only had 4 plants. one I gave to Dr. Gray another to Dr. Gray the 3rd to you & the 4th I have myself. I find Dr. Gray recognizes the Linum as distinct which it certainly is –

I have no more of the Pogonia and "Civilization" has exterminated the locality. If you will send a list of what you lack I will send them – that is if I have any left.

Very truly Yours

Coe F. Austin

P.S.
Yes Paine's Lake Ontario specimens are partly W. arrhiza. but I see no "green" surface – plant paler than ~~the other~~
Fronds. more oval(?) smaller, more solid, paler; chink smaller, not margined, etc.

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Rec^d Jan 8th
Ans Jan 11

Closter N. Jersey Jan. 2nd/64.

Dear Dr. Engelmann

I am about to commence the determination and publication of the North American Hepaticae. Messrs Lesquereux and Sullivant have already sent me their collections and I have a goodly number of my own. I believe you have promised to assist me by [illegible] loaning specimens for comparison.

I have already commenced with the Ricciae but find myself in want of foreign specimens for comparison. and if you have any, I should be exceedingly thankful for the loan of them for a short time and should return to you immediately all that

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I should not want to use and the rest as soon as I [illegible] should get through with them. Probably I will not require over a month or two at the furtherst ~~th~~ and possibly not over that number of weeks to get through using your specimens ~~o~~ of Riccia. I do not care particularly for other things at present. but of [illegible] it is absolutely necessary to have some foreign species of Riccia before anything useful can be accomplished in the way of studying up our species. I have received from M. Lesquereux European specimens of R. glauca, natans, fluitans, lamellosa (poor) Bischoffii, minima & R. crystallina — 7 species in all. about ½ the number of American species I have on hand. C.F.A.)

Very truly Yours

C. F. Austin

Dr. Engelmann
St. Louis Missouri

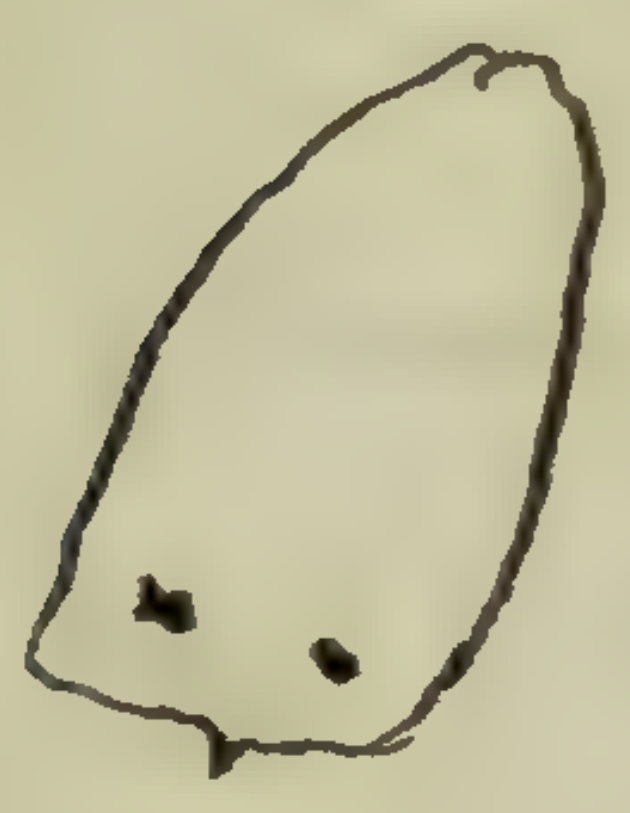
Rec^d Nov 22 1869

Closter N.J. Mar 9th, 1869

Dear Dr. Englemann

I enclose two Lemnaceae from Cuba Wright which appear to be interesting. No. 68 I can hardly reconcile with my notions of what L. minor should be. The frond is too thin & not vesiculose above ~~the~~ middle. I have not seen the fronds geminating only on one side and then the new frond shoots out at a very obtuse angle from the parent.

No. 70 has the ~~[illegible]~~ frond wavy or curved, otherwise I should have no hesitancy in calling it Wolffia Welwitschii - of which I know nothing except from the 3 or 4 fronds which I got from Herb. Gray. The specimens are in fine flowering & fruiting condition. There are two flowers constantly near the base of the frond. & these burst through the upper surface



I am just now at work on the Hepaticae again

Very truly Yours

Coe F. Austin

P.S. I Enclose a curious thing from Pigeon River Falls. ex Sullio

C.A.

Rec: July 13th
Ans Sept 2

Closter N.J. July 6th. 1869

Dr. Engelmann

Dear Sir —

Yours of 27th ult. is just received & very glad to hear that Dr. Somebody (I cannot make out the name) has been endeavoring to clear up the Callitriche and am greatly obliged for the information your epistle contain on the subject. I would like very much to see the work you speak of — could not you through your influence procure me a copy or loan me yours for a few weeks?

I make out six (N. American) species of Callitriche. Viz.

C. Verna. L.(?) Well characterized by the oval fruit with a remarkably plump appearance — sessile, and with a pair of bracts at its base. Stems 1' — to 2° (long.) Grows Everywhere

from Maine to N. Mexico. I
am not sure this plant occurs
in Europe - I have never seen
it from that locality, and think
it may be the C. Asa Grayi of —
if so his name will not stand
for all the forms of this plant
have been described by Nuttall
and other authors under the names
of C. linearis + brevifolia &c. &c.
(Its male flowers are often produced
under water!).

C. Autumnalis L. occurs in
British America, ~~but I do~~
Exactly the same as you sent
from Europe. [Vide Herb. Torrey
also Herb. Gray] Well charactered
by the broad ~~[illegible]~~ base of the
grass green leaves Etc Etc.

C. pedunculata Nutt!!! C. Nuttallii
Torr. !!! Well characterized by
the fruit being on a longer or
shorter peduncle which is thread
-shaped - (not tapering) the fruit

often buried in the soil by the deflexion of the peduncle! Said fruit is broader than long with a bulge in the centre and the rim is also bulged out or thickened giving ~~the f~~ it a remarkable appearance entirely different from all other species I have seen! — Louisiana &c.

C. peploides, Nutt!!! Stems erect - fruit Cruciate very characteristic. Everywhere along the Mississippi River

C. Marginata Torr!!! [C. Pterosperma, Gray!!! (or some ~~thing~~ ~~other~~ of the same import I ~~have~~ am away from home and cannot give the exact name now)]

This species is known at once by the long peduncle which is very broad at the base (often as broad as the leaf) tapering evenly upward - by the fruit having a mostly very broad

ring studded with stout
Rays like the spokes to a wheel,
Grows in N. Mexico &
California

C. Englehardtiana N. M.
Very distinct from any &
all forms of C. pedunculata
or any other species that I
have seen - Fruit very thin -
with plane flattish surfaces,
the nutlets are remarkably easy of sepa-
-ration and are somewhat echinate
on the back - This species comes
nearer to C. Margarita than
to any other. Grows on rocky
hills in old shady byways where
water has not stood since Noah's
flood often on steep side hills above
I will send a lot of it (here
It occurs throughout the western states!

When I again return Home I will send you a good lot of C. Venus ? and a fragment of C. pedalora &c.

What do you think of My New Pogonia? I have a few more specimens – It is a very distinct and pretty species – very different from P. verticillata, Nutt. so I think

We also have another species of Thalictrum – growing on rocky Hills & in Meadows – flowering in June a month earlier than T. ~~de~~ Cornuti with which it has been confounded. It remains in flower but a few days, not to exceed 10 (T. Cornuti remains in flower from July 1st. to Middle of Aug.) has dark purple stems & thick dark green leaves

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studded with waxy grain underneath - oblong - or lanceolate sepals which are as persistent as are the stamens - flowers with more or less of a purple tinge and almost perfectly dioecious.

(T. Comstii has sepals caducous ~~[illegible]~~ and nearly round - flowers always white: leaves thinnish smooth or pubescent below.) I believe I have sent them already but have collected a fine lot this spring.

I would like very much to ~~see~~ see the new work on Callitriche for I think I should knock the spots out of some of the N. S. in it. I am quite sure the C. ~~Asa Grayi~~ Asa Grayi - C. deflexa - C. Nuen-

-morali and probably the C. Macrostagyx are none of them n. sp.

I am greatly obliged for the C. stagnalis you sent - have seen it before from Europe - but never made up my mind fully about it - but am of the opinion it is one of the forms of C. verna L. which I believe to be distinct from the American plant usually called by that name.

Very truly yours

C. F. Austin

P. S. Your favor of Nov. 25th. was received. C. F. A.

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Rec. Sept 7th
ans Sept 28

Closter N.J. Sept. 1st. 1869

Dr. Englemann Dear Sir

I received a letter from you some time about the 1st. of July and answered it very shortly there-after enclosing a fine lot of Callitriche Englehardtiana. I again wrote about the 1st of Aug. enclosing ample specimens of C. Asagrayi? & C. platycarpa?: have not yet heard from these letters and am exceedingly anxious lest you did not receive them. Please let me hear from you at your earliest convenience and oblige

Very truly yours C. F. Austin

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ans^d. Dec 6

Closter N.J. Dec. 1st, 1869

Dear Dr. Englemann

Yours of 21st. ult. is rec'd. No doubt you had a profitable visit to Europe!

I have not paid much attention to Phaenogams [illegible] and have detected nothing interesting in that line lately.

Macoun has been to the L. Huron Country the past summer - what he found I have not yet learned.

Did I send you a specimen of the new Danthonia? It occurs also in Pennsylvania -

Send the Monograph of Lemnaceae to Either Dr. Torrey - when you have occasion to send a package to him - or else to C. F. Parker Phil^a when you send a package to that place.

Very truly Yours

Coe F. Austin

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[illegible] 27

Closter N. J. Sept. 23/70

Dear Dr. Engelmann

Some of our New York botanists have been after the Lemnas with a good deal of earnestness this summer, and one of them Mr. W. H. Leggett has found L. polyrhiza? in fruit. The utricle bears but one seed - and it may be a n. sp.

They want me to make a sketch of it for the draughtsman and have just sent me a few fine specimens but before I undertake this I want to see Engelmann's splendid work. If you have not yet sent my copy please do so at once and you will oblige me very much. Direct to

Closter
Northern R.R. of N.J.

If you have already sent it to Parker I will get it as I shall write him immediately to send it along - if he has it.

Have you seen the Lemna herein mentioned? if not I will send you some of it.

Henry Gillman
~~to~~ No. 5 Aspinall
Terrace Detroit Mich
sends Wolffia Columbiana in flower.

Very truly yours

C. F. Austin

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Recd July 2

Closter N.J. July 20th. 1871.

Dear Dr. Engelmann

In looking over my papers and clearing up some of my rubbish I find a letter directed to you as long ago as Dec. 18th. 1870. And acknowledging your letter of 12th Dec. and the receipt of "Hegelmaier's "Lemnaceae" I presume you had this long ago.

I see Mr. H. does not give L. punctata as a Synonym, why is this? (for his Spirodela oligorrhiza)

By the way there is a very old specimen of Lemna Valdiviana in Herb. Torrey under the name of "L. Cherokeensis nobis" I think from Schweinitz. A good deal of the "L. trisulca of Torr & Gr. in Bot. of Pacific R.R. Survey is this species! Hegelmaier has figured this species badly.

When you write to Hegelmaier
again please give him thanks
for me, for his fine work.
yet I don't know but you
are the person most entitled
to them.

Gillman just sent me some
fine flowering specimens of
L. trisulca from Detroit

Very truly yours

C. F. Austin.

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Rec'd April 18
Ans — 19

Closter, N.J. Apr. 8th. 1872.

Dear Dr. Engelmann

Your letter enclosing Wolffias was duly rec'd. Thanks for the specimens; they are highly interesting to me.

I want your opinion on the following little plant; unfortunately I have so little of the plant that I will not be able to furnish a specimen — at least of the first one.

Last fall, Mr. James sent me a few Pennsylvania Hepaticæ for determination, among them Aneura pinguis. Among the fronds of this I detected a few & coarse fibres which had much the appearance of rootlets of grasses or sedges, or something else, which are often found entangled among such moss as grow in similar situations, yet it struck me as being something new to my eyes. I carefully extricated a little of it and put it under the microscope; the minute pubescence & the articulation of the branches excited my curiosity and I searched carefully for more, this time I was rewarded with another fragment, being a fruit, which had been hidden under the fronds of the Aneura. I dissected the fruit, but found all the spores had disappeared.

The plant appears to belong to a new genus of the Filicoids, most nearly — yet distantly — related to Equisetum. And I have thought of naming it [illegible] Pennsylvanica. It was collected by Prof. Porter. —

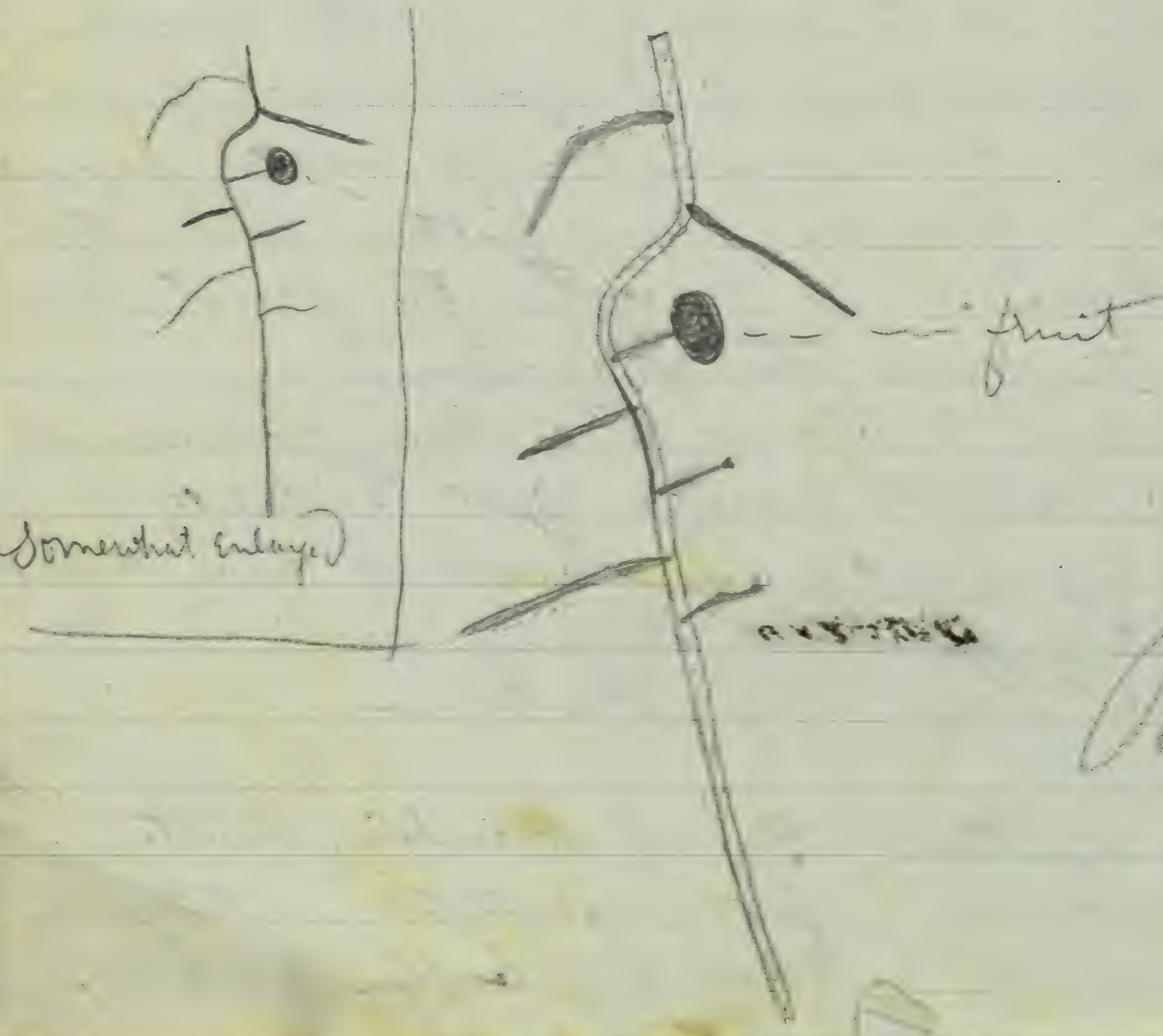
Stem scarcely thicker than a horsehair, terete, irregularly branched, pale, prostrate, entangled, rigid, minutely pubescent, leafless, rootless.

Branches articulated at the base, short, mostly at right angles to the stem (or nearly so).

Fruit a depressed = globose head, about 2"–2½" in diameter, borne on the apex of a branch, and composed of crowded, rigid, (somewhat woody) sporocarps? or scales [if sporocarps splitting to the base into 4 (always?), flabelliform concave segments of a peculiar cellular structure; if scales arranged in 4? (always?) and with the broad somewhat cucullate ~~their~~ apices (apparently at least) united].

Scales (divisions of the sporocarp?) obscurely costate toward the very narrow base, somewhat membranaceous towards the margin. Cells ? very long and irregularly tortuous, and with ~~peculiar~~ pores! (between them?)

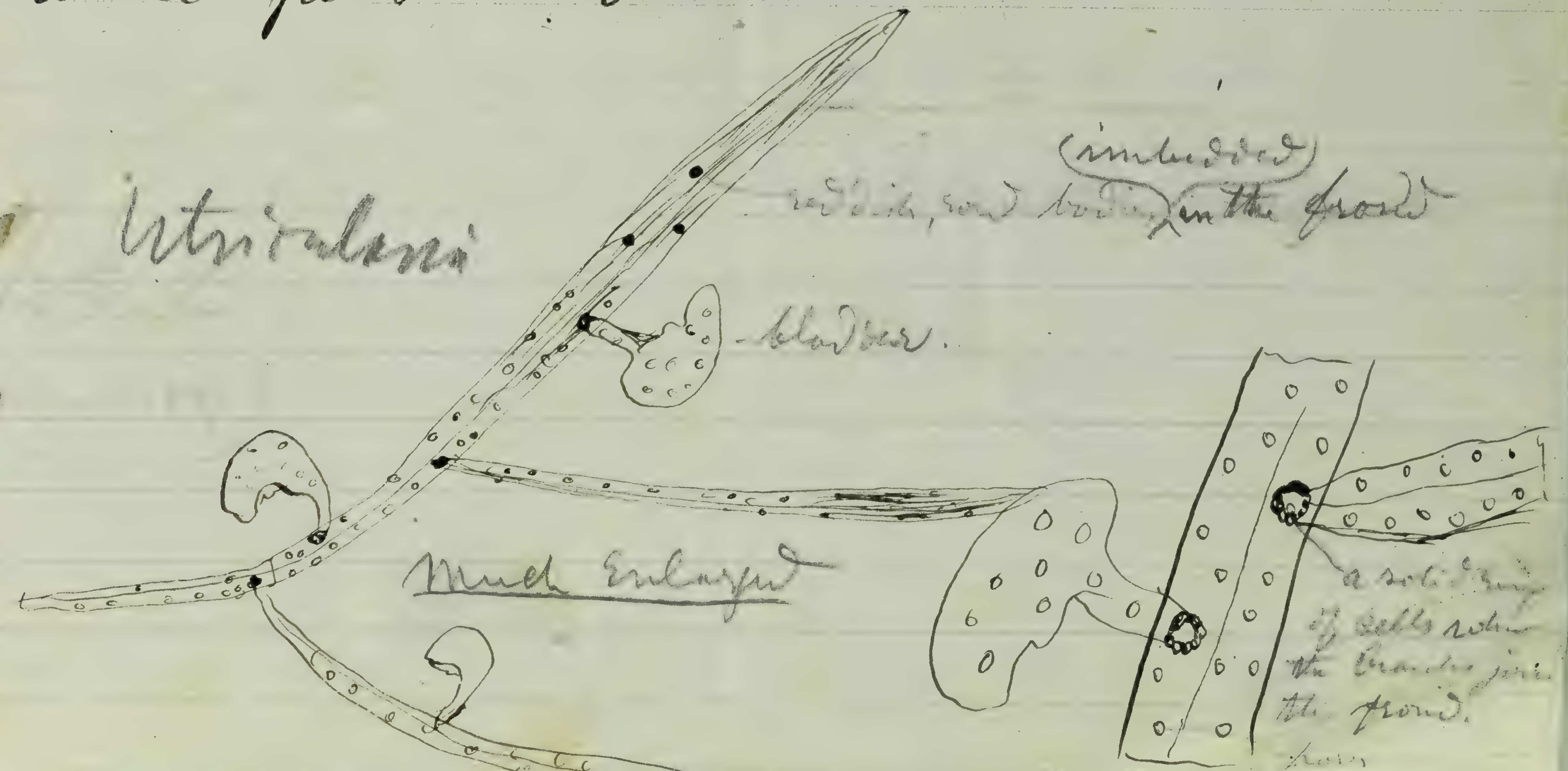
I send a rough sketch of the plant – below.



Pilularia?

The other plant Dr. Gray calls a "Utricularia" It was collected at Pigeon River Falls N.C. in 1844 doubtful by Mr. Sullivant & left with his Hepaticae, although he plainly did not consider it to belong ~~to~~ with them. I send a couple of fronds. It appears to me to be an Endogen & ~~I~~ somewhat related to Wolffia. —

Frondose: Fronds about 1' long by less than 1" wide, thin, with a slender ~~[illegible]~~ midnerve, linear (inclined to oblanceolate) the lower portion colorless, the reticulation obscurely defined, the base often considerably attenuated, apex obtusish margin entire. Branches (like the parent frond), articulated at the base; some of them transformed into curiously shaped bladders (represented in the sketch); connected with the surface of the frond between the midnerve & the margin. Rootlets none.
Surface of the frond with wart-like (elevated) round pores.


Utricularia
reddish, round bodies (imbedded) in the frond
bladder.
Much Enlarged
a solid ring of cells where the branches join the frond.
pores

I have a new Danthonia from the west end of Long Island, It is characterized by a slightly branched culm over 3 ft. high, and stout, flat rather wide leaves with naked and polished sheathes open panicle with longish branches each of which is subtended by a subulate bract, &c &c. Hope to be able to procure some specimens for you this summer.

Very truly Yours

Coe F. Austin

P.S.

D. compressa is not a good name for the species I have thus named, since ~~as~~ the ~~it~~ ~~is~~ culm is not compressed in ~~the~~ any of the numerous specimens collected by me in 1867 as I can see. Is it admissible to change a name when it is found to be inappropriate?

C.A.

Greenia

Rec'd April 29 1872
ans. May 9

Closter N.J. Apr. 25th. 1872

Dear Dr. Engelmann

Yours of 19th inst. is rec'd. Thanks for the specimens of Pilularia. The new Cryptogamic plant is *not* a Pilularia. Should not be surprised if it turns out to belong to a suborder of Filices or of Equisetaceae. The other plant may be a Utricularia. I know but little about this genus. Will look into it a little deeper at the first opportunity. The plant in question possess some very remarkable features, and I thought it might be allied to the Lemnaceae. Have just found a new Marsilia in a little sample of M. vestita. Ex Herb. Gray. Collected in Oregon

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by E. Hall, in 1871. The leaves are much less hairy than in M. vestita, and the elongated ovate-=oblong fruit is borne on a long flexuous peduncle.

I send all I have of both this & of the new Cryptogam. You may return them at your leisure.

Hope to find the new crypt this summer as its habitat is known — Bear Swamp. Penna. (Porter) Think I wrote you that I have another new [illegible]. Hope to get a supply of it this season. The stem branches from all the joints, but the lateral panicles are all (or ~~nearly~~ nearly) included in the sheathes. Hope to send it soon.

Very truly yours

Coe F Austin

Presume Dr. Porter will make a thorough search for the new Crypt. this summer: Guess it should be collected as early as July. The fruit on my specimen (collected in Oct.) is very old. No spores, yet this appears to be about all that is wanting to settle its relationships with other families of Crypts.

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Rec Octob 24

Austin C F

Closter N.J. Oct 17—72

Dear Dr. Engelmann

Your letter of recent date is recd. Thanks for the fine Lemna paucicostata!

Azolla Caroliniana was never found in N.J. to my knowledge. Never saw it growing. It is said to be very plenty in the bays &c., of the great lakes. e.g. Lake Ontario (Big Sodus Bay).

Have been to the W. Mts. for Mosses this fall. Did not find the county as prolific in species as I had hoped. Did not add many new things to our flora — probably about 3 Musci and a half dozen Hepaticae. There appears to be no broad plateaus in the alpine regions and no marshes to speak of.

Very truly yours Coe F. Austin

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Rec'd Jan 14th 1873
Ans — 21.

Closter N.J. Jan. 2nd, 1872

Dear Dr. Engelmann.

In looking over some Japan Hepaticæ, which I got from Mr. Sullivant, I found the Enclosed, under the name of "Riellia helioscopica?" It is not Riellia helioscopica! nor do I believe it is an Hepaticæ at all.

The frond resembles ~~th~~ an Aneura, but is of an entirely different structure, and appears to contain grains of starch.

The erect stems are much expanded at the hollow apex, which contains spores? or antheridia? or pollen grains? which are naked. They are clothed with small, irregular, contorted, loosely reticulated, distant, nerveless, scale or frond-like leaves.

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I have ~~not~~ examined the plant but very little, and send it to you hoping that you may know it.

I cannot form any idea as to its place ~~in~~ among ~~the~~ other plants. It may be a Phænogam, a Filicoid or an Hepaticoid for anything I have yet seen to the contrary.

Very truly yours

Coe F. Austin

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Rec' Oct. 3d.
Ans — 3d

A

Closter, N. J. Sept 30/73.

Dear Dr. Engelmann

I am now printing the Labels &c, of the Hepat. Exsic. It comprises 175 numbers, many of them rare or little known species. The price for the first 20 sets will be $15, but I shall not get up any more at that price.

I propose to go to Florida this winter on an exploring expedition for Mosses &c. Had Mr. Sullivant lived He was to pay my expenses but as it has turned out I must raise the necessary funds by subscriptions. I propose to fix them at $10–15 & each subscriber to receive a set of the specimens on my return. Do you feel like taking any stock in the enterprise? Guess it will be full as good as Northern Pacific! Cant promise certain that it will be any better, but I hope to make it, in time, above par!

Florida appears to be mostly an unexplored region & ought to afford many new or rare things in the botanists' line.

Will send you a copy of the pamphlet of

the Hepaticae as soon
as it is completed.

Very truly yours

Coe F. Austin

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Rec'd Dec 14 1876

I got a letter from you last summer requesting me to make collections of specimens of Oaks - I regret that I could not attend to this. a few yrs. ago I was anxious to do this - in fact did make large collections, but Drs. Torrey & Gray did not think them of any account, - would not even look at them & so they were not preserved. Now I can not afford the time - in fact shall be obliged to forego all botanical studies after this winter

CFA

Closter, N.J. Dec 12/76.

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DEC 13

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Dr Geo. Engelmann
Saint Louis
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